

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE

1. CERTIFICATE NUMBER: 14-R-0009
CUSTOMER NUMBER: 105

FORM APPROVED
OMB NO. 0579-0036

ANNUAL REPORT OF RESEARCH FACILITY
(TYPE OR PRINT)

Boston University Medical School
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Boston, MA 02118

JAN 11 2008

Telephone: (617) -638-4089

3. REPORTING FACILITY (List all locations where animals were housed or used in actual research, testing, or experimentation, or held for these purposes. Attach additional sheets if necessary)

FACILITY LOCATIONS (Sites) - See Attached Listing

REPORT OF ANIMALS USED BY OR UNDER CONTROL OF RESEARCH FACILITY (Attach additional sheets if necessary or use APHIS Form 7023A)

A. Animals Covered By The Animal Welfare Regulations	B. Number of animal being bred, conditioned, or held for use in teaching, testing, experiments, research, or surgery but not yet used for such purposes.	C. Number of animals upon which teaching, research, experiments, or tests were conducted involving no pain, distress, or use of pain-relieving drugs.	D. Number of animals upon which experiments, teaching, research, surgery, or tests were conducted involving accompanying pain or distress to the animals an for which appropriate anesthetic, analgesic, or tranquilizing drugs were used.	E. Number of animals upon which teaching, experiments, research, surgery or tests were conducted involving accompanying pain or distress to the animals and for wh the use of appropriate anesthetic, analgesic, or tranquiliz drugs would have adversely affected the procedures, res or interpretation of the teaching, research, experiments, surgery, or tests. (An explanation of the procedures producing pain or distress in these animals and the reas such drugs were not used must be attached to this report	F. TOTAL NUMBER OF ANIMALS (COLUMNS C + D + E)
4. Dogs	Ø	Ø	Ø	Ø	Ø
5. Cats	Ø	Ø	36	Ø	36
6. Guinea Pigs	Ø	Ø	Ø	Ø	Ø
7. Hamsters	Ø	Ø	20	Ø	20
8. Rabbits	Ø	23	66	Ø	89
9. Non-human Primates	Ø	Ø	36	11	47
10. Sheep	Ø	Ø	Ø	Ø	Ø
11. Pigs	Ø	Ø	23	Ø	23
12. Other Farm Animals	Ø	Ø	Ø	Ø	Ø
13. Other Animals					
Chinchillas	Ø	Ø	128	Ø	128

ASSURANCE STATEMENTS

- 1) Professionally acceptable standards governing the care, treatment, and use of animals, including appropriate use of anesthetic, analgesic, and tranquilizing drugs, prior to, during, and following actual rese teaching, testing, surgery, or experimentation were followed by this research facility.
- 2) Each principal investigator has considered alternatives to painful procedures.
- 3) This facility is adhering to the standards and regulations under the Act, and it has required that exceptions to the standards and regulations be specified and explained by the principal investigator and ap Institutional Animal Care and Use Committee (IACUC). A summary of all such exceptions is attached to this annual report. In addition to identifying the IACUC-approved exceptions, this summary inc brief explanation of the exceptions, as well as the species and number of animals affected.
- 4) The attending veterinarian for this research facility has appropriate authority to ensure the provision of adequate veterinary care and to oversee the adequacy of other aspects of animal care and use.

CERTIFICATION BY HEADQUARTERS RESEARCH FACILITY OFFICIAL
(Chief Executive Officer or Legally Responsible Institutional Official)

DATE SIGNED

12/17/02

(b)(6), (b)(7)c

CLC-h

Column E Explanation

1. Registration Number: 14-R-0009

2. Number of animals used under Column E conditions in this study. Eleven (11)

3. Species (common name) of animals used in this study. Rhesus monkeys

4. Explain the procedure producing pain and/or distress.

The proposed housing conditions in one protocol were determined by the IACUC to require the animals enrolled in this project be classified as USDA Pain Category E. Three exemptions from accepted standards of care for nonhuman primates, as described in the Guide for the Care and Use of Laboratory Animals (ILAR/NRC 1996) and the Animal Welfare Regulations, were approved as scientifically justified. The three points of exemption related to: illumination, socialization and environmental enrichment. These conditions were considered to be distressful to the animals and could not be relieved by the use of appropriate anesthetic, analgesic, or tranquilizing drugs. The IACUC approved these exemptions because it determined the conditions to be scientifically justified and the use of drugs would adversely affect the procedures, results, or interpretation of the teaching, research, experiments, surgery, or tests.

Exemptions:

- *Lighting.* This project involves housing animals in constant dim light (20 lux at cage top level) during constant condition parts of the study for a maximum of three separate periods which range from 3 to 20 weeks. During the remainder of the experimental period the animals are in environmentally controlled housing on a 12:12 hr light:dark cycle.
- *Socialization.* Throughout the entire protocol, the animals are housed in specially designed individual sleep/circadian chambers that contain an over-sized steel primate cage. The chambers provide controlled levels and timing of environmental illumination, low noise level and limited intra- and inter-species interactions. Limiting inter-specific and intra-specific interactions for periods up to 102 weeks, as well as exposure to facility noise to randomly scheduled times, ensures that each animal's behavior reflects endogenous processes rather than responsiveness to the events in their environment.
- *Environmental enrichment.* Isolation of the animals from each other is a critical part of the experimental design when studying circadian rhythms. Sources of enrichment that partially compensate for lack of social interactions that are used in the protocol include toys and mirrors in each cage and access to "in-house" computerized performance exercises.

5. Provide scientific justification why pain and/or distress could not be relieved. State methods or means used to determine that pain and/or distress relief would interfere with test results.

The results of the circadian studies are purely statistical, since multiple factors are involved in daily behaviors, and no conclusion can be made regarding a circadian rhythm of cognition or sleep based on few data points collected over several days. That is why all the circadian studies are inherently long and are conducted continuously and in extremely well-controlled conditions in order to reduce their duration, while collecting sound scientific data.

Nonstandard lighting and socialization can not be relieved, nor can standard methods of environmental enrichment be provided, because of the requirement for constant dim lighting and isolation in circadian chambers which allow each animal to express and maintain individualized circadian pattern of activity, sleep and feeding, without interference from the facility noise or other monkeys. On each given day, animals eat or sleep, or do cognitive tests at different hours. Thus, experimental results can be based on the statistical analysis of a large data set that may reveal common patterns between many consecutive days of uninterrupted and undisturbed recordings in a statistically significant number of animals. These animals will be studied in both standard light-dark cycle and constant dim light conditions while being socially isolated and deprived of traditional environmental enrichment.